

CLAIMS

1. A respiratory aid apparatus for administering a controlled flow of respiratory gas to a user airways, the apparatus comprising:
 - a source of a high pressure respiratory gas;
 - a nasal interface comprising at least one tubular member defining an air passage to the user's nostril when in use and at least one Venturi device in fluid communication with said air passage, the Venturi device comprises:
 - a hollow member, defining a central space, having a first end open to surrounding ambient air and a second open end in fluid communication with said air passage; and
 - a first inlet port opening into said central space, the inlet is configured to direct compressed respiratory gas entering said central space toward the second end;
 - and
 - a low cross-section flexible tubing connecting between the source of high pressure respiratory gas and said inlet of said Venturi device.
2. The apparatus of claim 1 wherein the respiratory gas is air.
3. The apparatus of claim 1 wherein the source of high pressure respiratory gas is an oil-less air compressor.
4. The apparatus of claim 1 wherein the source of high pressure respiratory gas is a tank containing high pressure respiratory gas.
5. The apparatus of claim 4 wherein the respiratory gas is oxygen.

6. The apparatus of claim 1 wherein the tubing diameter is in the range of 2 –5 mm and wherein the pressure delivered to the nasal interface is in the range of 2 – 6 atmospheres.
7. The apparatus of claim 1 wherein the source of high pressure respiratory gas is provided with a regulator for regulating the output pressure of said source.
8. The apparatus of claim 1 further provided with at least one sensor for detecting respiratory cycle of the use and with at least one controller for controlling the pressure of compressed gas entering the interface unit via the first inlet port, in accordance with said sensor.
9. The apparatus of claim 8 wherein the sensor is incorporated within the nasal interface unit.
10. The apparatus of claim 8 wherein the sensor is selected from a sound transducer, a pressure detector, a temperature detector or a humidity detector.
11. The apparatus of claim 1 wherein the Venturi device further comprises a second inlet port opening into said central space and wherein said second inlet is configured to direct compressed gas entering the central space toward the first end for assisting removal of air from the user's airways.
12. The apparatus of claim 11 further provided with a controllable valve for directing the compressed air alternately to the first inlet port during inhalation phase and to the second inlet port during exhalation phase.
13. The apparatus of claim 1 wherein the nasal interface comprises two tubular members each defining an air passage to a user's nostril, the two air passages are

in fluid communication via a common space and wherein said Venturi device is in fluid communication with said common space.

14. The apparatus of claim 1 wherein the nasal interface comprises two tubular members each defining an air passage to a user's nostril and two Venturi devices, each in fluid communication with one of the two air passages, each of the two Venturi devices comprises:

a hollow member, defining a central space, having a first end open to surrounding ambient air and a second open end in fluid communication with respective air passage; and

a first inlet port opening into said central space, the inlet is configured to direct compressed gas entering said central space toward the second end.

15. A user nasal interface unit comprising at least one tubular member defining an air passage to a user's nostril when in use and at least one Venturi device in fluid communication with said air passage, the Venturi device comprises:

a hollow member, defining a central space, having a first end open to surrounding ambient air and a second open end in fluid communication with said air passage; and

a first inlet port connectable via thin tubing to a source of high pressure respiratory gas, the inlet opens into said central space, the inlet is configured to direct compressed gas entering said central space toward the second end.

16. The user nasal interface of claim 15 wherein the Venturi device further comprises a second inlet port opening into said central space, wherein said second inlet is configured to direct compressed gas entering the central space toward the first end for assisting removal of air from the user's airways.

17. The user nasal interface of claim 16 further provided with a controllable valve for directing the compressed air alternately to the first inlet port during inhalation phase and to the second inlet port during exhalation phase.
18. The user nasal interface of claim 15 further comprising a sensor for detecting respiratory cycle of the user.
19. The user nasal interface of claim 15 comprising two tubular members each defining an air passage to a user's nostril, the two air passages are in fluid communication via a common space and said Venturi device is in fluid communication with said common space.
20. The user nasal interface of claim 19 mounted on a mouth piece such that when the mouth piece is inserted into the user mouth, each of the two tubular members is insertable into one of the user's nostrils.
21. The user nasal interface of claim 15 wherein the Venturi device further comprises a second inlet port opening into said central space and wherein said second inlet is configured to direct compressed gas entering the central space toward the first end for assisting removal of air from the user's airways.
22. The nasal user interface of claim 15 comprising two tubular members each defining an air passage to one of a user's nostrils and two Venturi devices, each in fluid communication with one of the two air passages, each of the two Venturi devices comprises:
 - a hollow member, defining a central space, having a first end open to surrounding ambient air and a second open end in fluid communication with respective air passage; and

a first inlet port opening into said central space, the inlet is configured to direct compressed gas entering said central space toward the second end.

23. The user nasal interface of claim 22 wherein the two Venturi devices are mounted on a mouth piece such that when the mouth piece is placed in the user mouth, each of the two tubular members is insertable into one of the user's nostrils.
24. The user nasal interface of claim 15 wherein the user interface is strapped to the user head by the thin tubing delivering the compressed gas into the user interface.
25. A method for supplying a controlled pressure of respiratory gas of to a user, the method comprising:
 - delivering a high pressure respiratory gas via a thin tubing to a user nasal interface; and
 - accelerating the high pressure respiratory gas upon entering the user nasal interface by means of a Venturi device, the Venturi device is configured to direct flow of compressed air toward the user airways, the Venturi device is having an end open to surrounding ambient air;
 - thereby pumping ambient air into the user interface.
26. The method of claim 25 wherein the respiratory gas is air.
27. The method of claim 25 further comprising controlling the pressure of the high pressure respiratory gas delivered to the user interface.
28. The method of claim 25 further comprising stopping the delivery of high pressure respiratory gas during exhalation phase.

29. The method of claim 25 wherein the Venturi device is provided with an additional inlet configured to direct compressed air toward the end open to ambient air and wherein the method further comprising delivering the high pressure respiratory gas to said additional inlet for assisting removal of air from the user airways during exhalation phase.
30. The use of a Venturi device incorporated into a user nasal interface unit in fluid communication with a user airways for administering a controlled pressure of air to the user.